BUROHAPPOLD ENGINEERING

Tottenham Hotspur Football Club

Southern Residential Operational Waste Management Strategy

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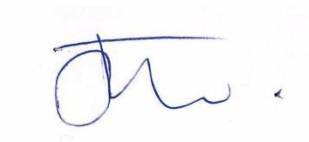
signature	
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1 Introduction

An Outline Operational Waste Management Strategy is required to support the outline planning application for the Tottenham Hotspur Football Club (THFC) four residential towers located in Tottenham, North London. The proposals are for the towers to contain a mixture of studios, 1, 2, and 3 bedroom flats as well as 5 town houses. The residential towers development forms sits in the north east corner of the wider THFC Masterplan which includes the stadium, THFC experience, THFC hotel and a public square (which will contain spectator screens for members of the public to watch events taking place within the stadium).

This document forms the Operational Waste Management Strategy for the THFC residential towers only and covers how waste within the development will be managed. This development will operate and be run independently. A separate Operational Waste Management Strategy has been prepared for the stadium, THFC experience, THFC hotel and public square. The planning application for the residential towers is due to be submitted to the London Borough of Haringey (LBH) in August 2015.

The management of solid waste is an important element to consider as buildings are designed. Planning for future operational waste management ensures that a building will be able to operate efficiently and sustainably while minimising the impacts on the designed requirements building performance and site users. Good waste management will be essential ensure safe operational practice throughout the development. The waste management strategy must ensure that the residential tower Facilities Management (FM) teams can collect, store, recycle, re-use and dispose of waste quickly and efficiently and in a discreet manner in line with THFC Waste Management Policy and the waste hierarchy as shown in **Figure 1.** Waste management operations will need to be hidden from visitors and residents to ensure that they do not interfere with the day to day operations within the residential towers.

Figure 1: The Waste Hierarchy

01 Minimise the amount of waste produced and avoid producing waste in the first instance

02 Re-use items as many times as possible

03 Recycle what you can once you have re-used it and it is no longer able to be used or is no longer needed

04 Turn waste materials into a new product where possible i.e. the generation of waste from energy

05 Dispose of what is unable to be recovered in a responsible way

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In summary, the aims of the Operational Waste Management Strategy are to:

- Provide an outline estimate of anticipated waste generation for the residential towers;
- Provide guidance on waste management to ensure that adequate spatial provision for clean, hygienic and efficient storage and collection of waste is incorporated into the design. This is essential to the successful operation and aesthetics of these buildings;
- Enable the residential towers FM teams to collect, store, recycle, re-use and dispose of the different types of waste quickly, sustainably and efficiently and in a discreet manner;
- Ensure national and local targets as well as any other client waste management aims and aspirations (which are outlined in full in **Appendix A**) are met; and
- Ensure that waste management practices are efficient and improve productivity whilst championing environmental protection principles.

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2 Anticipated Generation and Bin Numbers

2.1 Waste generation

In order to determine spatial requirements for waste in the residential towers, outline waste generation and bin numbers have been generated. This has been based on the Allies and Morrison area schedule (1007 Tottenham Towers Rev 2, dated 13/07/15) and drawings (1007_03, dated 02/06/15) and a number of assumptions which are outlined below. LBH do not provide any specific generation rates for commercial or residential waste, therefore waste generation rates from waste audits undertaken in similar developments have been utilised. The waste generation estimates provided in **Table 1** are high level and are based on the following assumptions which are subject to change:

- Revised accommodation schedule dated 13/07/15;
- Average recycling target of 50%;
- The British Standard (BS5906:2005)- Waste Management in Buildings, with weekly generation rates as follows: 100litres per 1 bed unit, 170 litres per week 2 bed unit, 240litres per week 3 bed unit; and
- An outline agreement with LBH was made which allowed for waste from the residential towers can be collected twice weekly (if required) for mixed recyclables, residual and organic (food) waste by LBH.

Table 1: Residential Towers and Hotel Waste Generation Estimates

Land use	Capacity (units)	Estimated weekly waste (litres per week)
Tower A	168	23,520
Tower B	90	12,820
Tower C	232	32,160
Tower D	90	12,820
Town Houses	5	1,200

Outline waste generation calculations estimate that approximately 83,000 litres per week from the four residential towers. This is equivalent to approximately 16,500 tonnes of waste per week. A further break down of waste generation on the basis of room type (e.g. studio litres per week) has been provided in **Appendix B**.

2.2 Outline bin numbers

The waste generation estimates for the residential towers have been used to estimate the likely number of bins that will be required within the buildings, shown in **Table 2**. This has been calculated based on an anticipated collection frequency twice a week collection. Mixed recyclables, residual waste and organics will be collected. Other waste streams will be collected at less frequent intervals as and when they are needed.

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Table 2: Residential towers and hotel waste bin number estimates

Land use	Bin numbers for recyclables	Bin numbers for organic (food) waste	Bin numbers for residual waste
Tower A	6 x 1100 litre bins	5 x 240 litre bins	3 x 1100 litre bins
Tower B	2 x 1100 litre bins	6 x 240 litre bins	2 x 1100 litre bins
Tower C	8 x 1100 litre bins	14 x 240 litre bins	5 x 1100 litre bins
Tower D	3 x 1100 litre bins	6 x 240 litre bins	2 x 1100 litre bins

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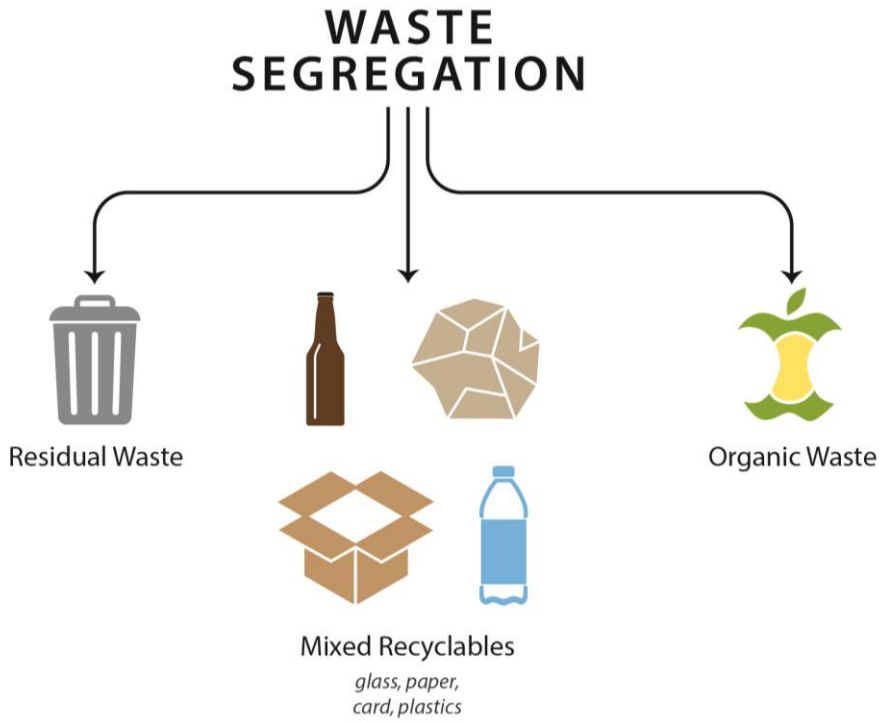
3 Waste Management within the Residential Towers

3.1 Waste Segregation

Within the residential towers the following three main streams: residual waste, mixed recyclables (glass, paper, cardboard and plastics) and organic waste (food) as outlined in **Figure 2**.

Figure 2: Segregation of Waste and Recyclables



3.2 Key Waste Management Operational Principles

Waste management infrastructure within the towers must ensure that waste management operations are hidden and do not interfere with residents or have a detrimental impact on the aesthetics of the buildings. Adequate spatial provision for clean, hygienic and efficient waste management services has been provided. A summary of how waste will be stored, collected and treated throughout the residential towers is provided below.

Storage

Each of the residential towers contains a dedicated waste and recycling room and a smaller bulky waste room on the ground floor of the buildings. Residents will be responsible for transferring their waste from their property to the ground floor, via the lifts or stairs within the building and segregating their waste and placing it into the appropriate receptacle. Each of the buildings is self-sufficient and all waste will remain within the building in which it is generated with rooms sized accordingly.

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The following LBH information has been used to provide advice to the design team on the recommended spatial provision within each of the residential towers. Assumptions have also been made by BuroHappold, based on previous experience on how much space per bin should be allocated. This includes space for the manoeuvring of the bins:

- The dimensions of a 1100 litre bin are: 985mm(D) x 1260mm(W) x 1370mm(H). It is estimated that each 1100 litre bin will each require approximately $3.5m_2$ of space within the residential towers (this includes space around the bins); and
- The dimensions of a 240 litre bin are: 730mm(D) x 580mm(W) x 1080mm(H). It is estimated that each 240 litre bin will require approximately $1.4m_2$ of space within the residential towers (this includes space around the bins).

The waste and recycling room is made up of two distinct areas. It comprises a small area, which is accessible to residents to deposit their waste and contain a minimum of three bins (1 x 1100 litre bin for residual waste, 1 x 1100 litre bin for recyclables and 1 x 240 litre bin for organic (food) waste). A larger area will also be present which contains the remainder of the bins required for the tower. This room will only be accessible to the FM team who will service the small room on a daily basis and exchange the full bins with empty bins. If residents have access to all of the bins it is likely they will just throw waste into the nearest bin and recycling rates will be poor.

The larger of the two areas will include some spare capacity to prevent overflow during unusual activity i.e. bad weather, collection cancellations, refurbishment phases etc. and a bin wash area. All bins will be washed when required by FM staff. Space for cleaning equipment will also be allocated within the larger area.

The waste rooms have been positioned as close as reasonably practical to the lifts to minimise the distance that residents have to transport their waste. All flats will be within a 30m horizontal travelling distance of the waste room. A summary of the sizes of the rooms provided in each tower are outlined in **Table 3** below.

Table 3: Waste and recycling and bulky waste room size and components

Land use	Minimum Required Size of Waste and Recycling room	Size of Bulky Waste room	Room components
Tower A	$26m^2$	$5m^2$	Bin wash
Tower B	$14m^2$	$5m^2$	Bin wash
Tower C	$36m^2$	$10m^2$	Bin wash
Tower D	$15m^2$	$5m^2$	Bin wash

Access to the waste rooms will be restricted to residents, the FM team and the LBH waste collection teams only for security purposes. It is anticipated this will be via a swipe card or key code system.

Collection

Discussions the LBH have been undertaken and it has been agreed that a twice weekly collection of waste will be possible (confirmed during meeting 04.08.15). This will be undertaken by LBH on designated days. There is access from the waste rooms to external serving bays on Park Lane and Worcester Avenue where waste collection vehicles will be able to pull up outside the towers and collect the residential waste. Waste will be wheeled out to the laybys by the FM team on the designated days. An illustrative plan is provided below in **Figure 3**.

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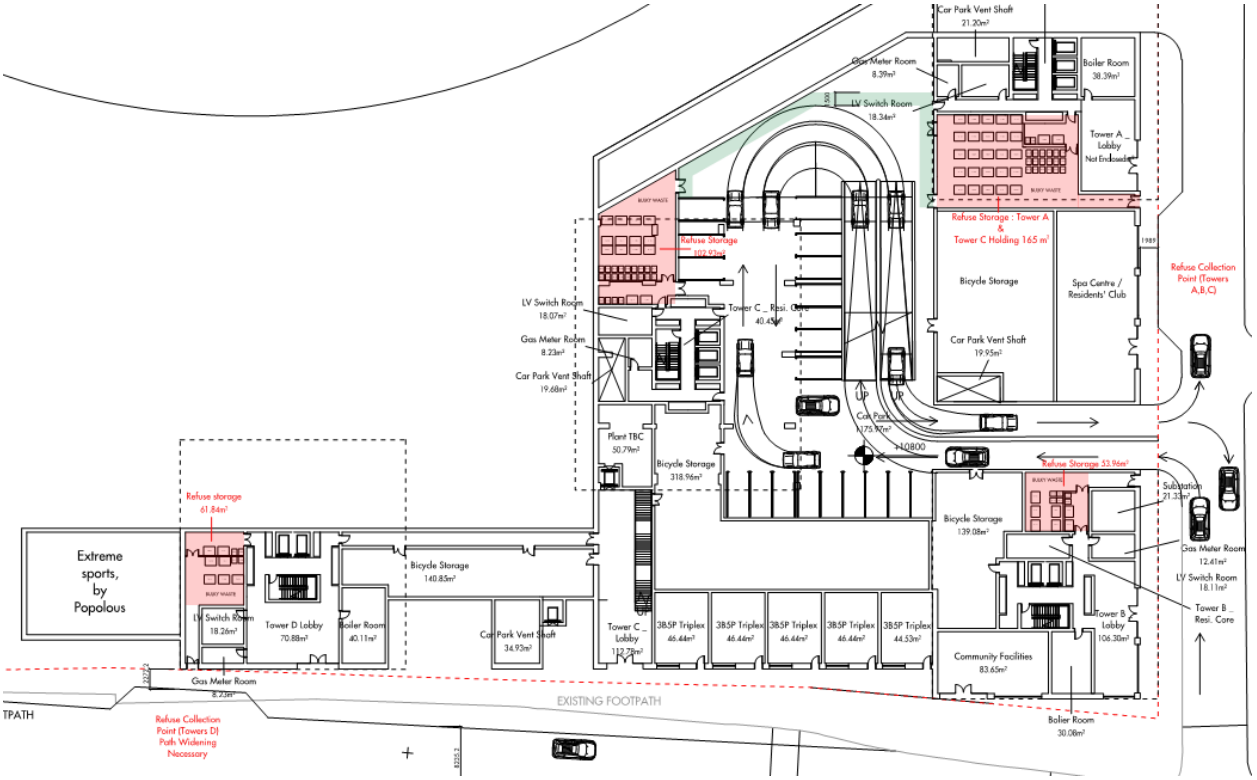

Figure 3 : Waste collection strategy

Due to the limitations outlined waste cannot be directly collected from Tower C by the current fleet of refuse vehicles serving Haringey. For the purpose of servicing Tower C where waste collection vehicles will not be able to access and operate within the car park area, waste will be wheeled by the FM team from the waste storage area around the north of the car park to a holding area in Tower A. A 1.5m wide marked route for pedestrian movement has been created to make this route as safe as possible. This will then be serviced as above.

On agreed collection days a designated member of the FM will be responsible for moving bins from Tower C to Tower A prior to waste collection services beginning in the borough either early morning or night before. This will ensure that the bins from Tower C are in Tower A ready for collection, the contractor with the assistance of the FM team will then move bins out from the refuse stores to the agreed collection points when the contractor arrives on site.

In order to overcome the above the team has sized the refuse store in Tower A suitably so as it can contain half a weeks' worth of waste from both Towers A and C. This is illustrated in **Figure 4** below.

In the instance that the designated member of the FM team is not on site for reasons of sickness, annual leave or otherwise the duty will be handed over to an alternative member of the FM team and a management plan with such procedures will be prepared to mitigate this. Should in the unlikely event that all the FM are not available this duty will be undertaken by the FM team from others areas of the Masterplan (i.e. stadium or hotel).

It is acknowledged that the bins once full are heavy and as such it is proposed that an Electric Vehicle (EV) is used to transport waste from Tower C to holding in Tower A. Provisions for this (i.e. parking and charging) will be made onsite or accommodated elsewhere in the Masterplan. Bin rooms and doors have been appropriately sized to enable this.

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Figure 4 : Waste storage area Tower A indicating actual bin number predicted and their storage allowance (to scale)

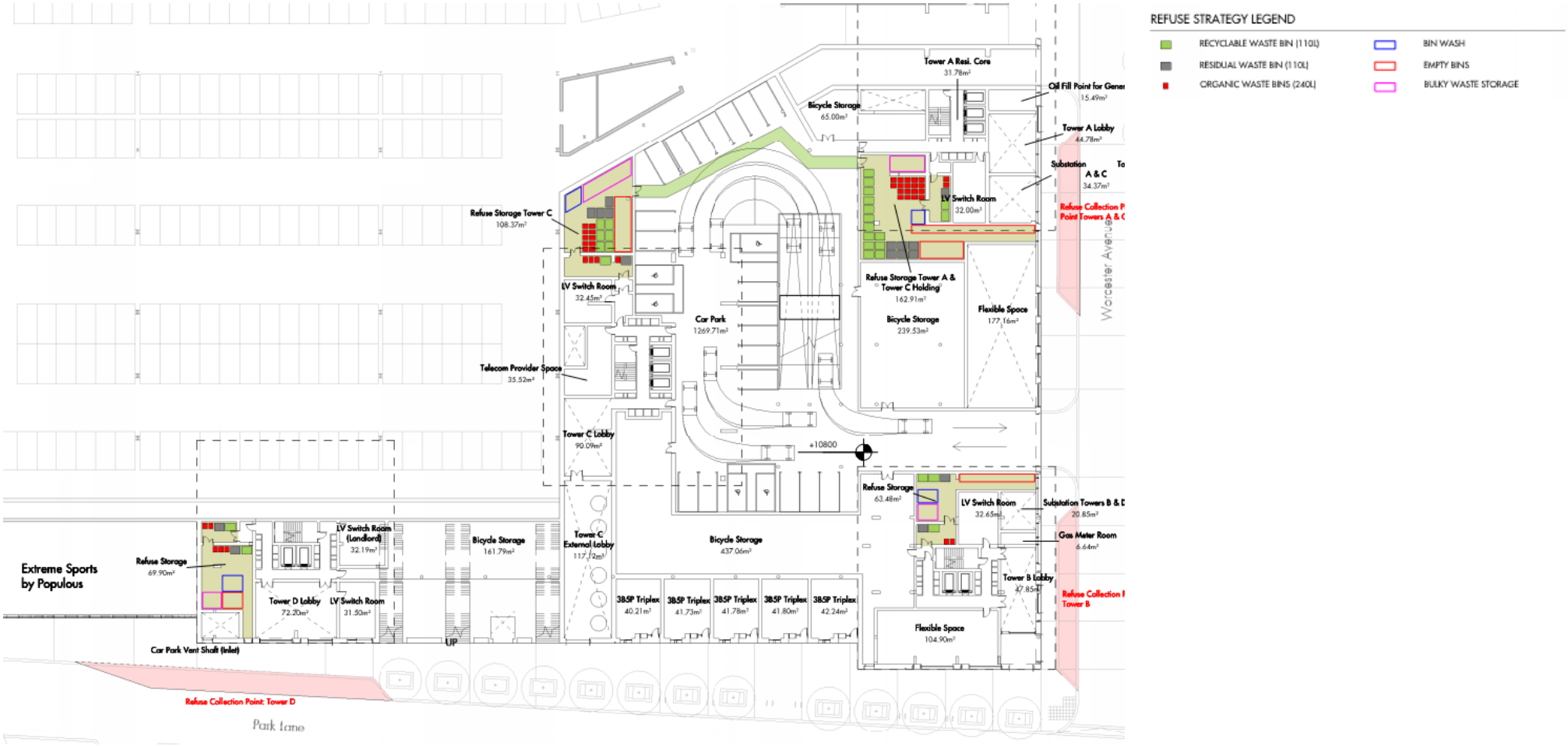

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Figure 5 details the proposed layby design.

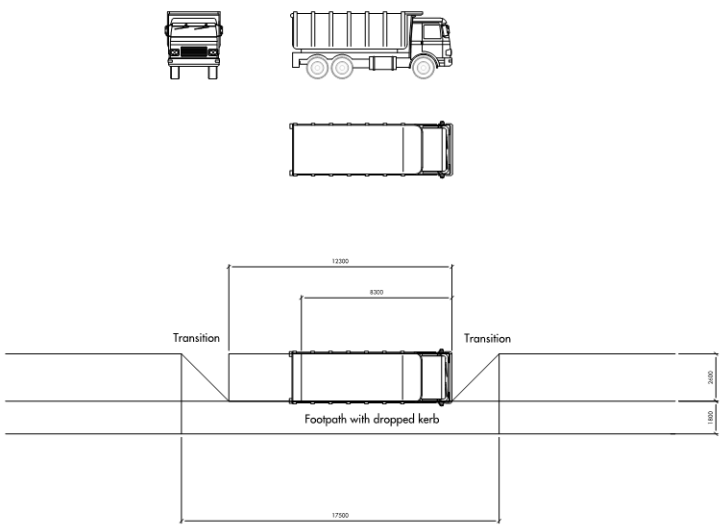

Figure 5 : Proposed layby diagram

Education

THFC will aim to educate residents about the importance of recycling and provide three-stream bins within all units. Where bins are located within the waste rooms, clear signage with recycling and disposal guidance will be provided.

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4 Conclusions

- Productive and efficient waste management practice is required within the residential towers to ensure waste is managed in a way that ensures waste management operations are discreet and hygienic. The client hopes that the developments will be a leading example of excellent waste management within the residential and hospitality sectors, which achieves a recycling rate of at least 50%, with the aim of improving recycling rates and reducing waste generation each year following opening;
- Outline waste generation calculations estimate that approximately 83,000 litres per week; and
- Waste will be segregated at source, where practicable into the following three main streams: residual waste, mixed recyclables (glass, paper, cardboard, plastics) and organic waste (food).
- This strategy has been agreed to by Jim Goodson and Wisdom Osei-Wusu of Harringey Council as per their confirmation email 26.08.15.

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Appendix A - Waste Management Practice and Policy

Information on the relevant national and local waste management practice and policy is provided below. There is a large amount of national policy and guidance for residential developments. Little LBH guidance for commercial waste is available. Existing guidance provides comprehensive and detailed storage and collection requirements for new developments within the borough although the focus is on residential developments. However, the guidance provides direction to ensure good practice and effective and efficient waste management.

National Policy

Government Review of Waste Policy 2011

Prioritises efforts to manage waste in line with the waste hierarchy and reduce the carbon effect of waste. This document also encourages waste prevention and re-use, supporting greater efficiency and initiatives which reward and recognises individuals who reduce, re-use and recycle their waste. It also sets out plans to work with councils to increase the frequency and quality of rubbish collections and make it easier to recycle.

Hazardous Waste (England and Wales) (Amendment) Regulations 2009 SI 507

The Hazardous Waste Regulations, which came into force in 2005 provide requirements for controlling and tracking the movement of hazardous waste and bans mixing different types of hazardous waste.

The Waste Strategy for England 2007 (WS2007)

The Department of Environment Food and Rural Affairs (DEFRA) in 2009 updated the published WS2007. There is a focus primarily on Municipal Solid Waste (MSW), as well as making provision for the future creation of recycling / recovery targets for Commercial & Industrial (C&I) waste.

The Waste (England and Wales) (Amended) Regulations 2012

These regulations came into force 29 March 2011. The regulations implement the revised Waste Framework Directive and require businesses to confirm that they have applied the waste management hierarchy when transferring waste. They introduce a two-tier system for waste carrier and broker registration along with a new concept of waste dealer. They also exclude some categories of waste from waste controls and include a small number of radioactive materials.

Making Space for Waste, A Practical Guide for Developers and Local Authorities, June 2010

This document was designed to allow developers to follow a step by step process when considering the design of waste facilities in new developments.

Material Recovery Facility (MRF) Code of Practice for England and Wales:

The regulations require all permitted MRFs processing more than 1,000 tonnes of dry recyclables per annum to measure and report the quality of the input, output and residual waste streams every three months. This is intended to boost confidence in the quality of material produced at MRFs.

The Producer Responsibility Obligations (Packaging Waste) (Amendment) Regulations 2012

Aims to achieve requirements of the EU Directive 94/62/EC (as amended) by setting packaging recycling targets on larger UK business.

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Local Policy

The London Plan 2013 (Sustainable Design and Construction Supplementary Planning Guidance April 2014)

Describes an integrated economic, social environmental and transport framework for the development of London over the next 20 to 25 years. The plan sets out to improve the environment and tackle climate change by reducing CO_2 emissions and improving London's recycling performance and waste management. The plan provides updated guidance on designing out waste in buildings during the early stages of a project and on the importance of sufficient and well-designed storage for recyclables, organic and residual waste and the implementation of the waste hierarchy.

The Mayor's Municipal Waste Management Strategy 2011

This document sets out the Mayor's policies and proposals for reducing the amount of municipal waste produced, increasing the amount of waste re-used, recycled or composted, and generating low carbon energy from waste remaining. This strategy also sets out how the Mayor, through the London Waste and Recycling Board, will help develop waste management infrastructure in London. Broadly, the key targets are for zero waste to landfill, a reduction in household waste generation rates of 20%, increased recycling rates to 60% and the generation of energy from waste where appropriate. The Mayor's targets are for London as a whole, placing no specific requirements on individual waste authorities to achieve them.

The Mayor's Business Waste Management Strategy 2011

Sets out initiatives to help London's business (from shops, restaurants, office buildings, manufacturers to construction companies) to save money and reduce harm to the environment through better waste management. Of specific relevance here are the Mayor's proposals to ensure buildings provide suitable storage and access for the management of waste. Additionally, the Mayor will be supporting planning guidance to engage developers, architects and designers in looking for ways to design out waste at source and improve the overall resource efficiency of buildings and infrastructure projects.

London Borough of Haringey (LBH)

Information related to the current waste management practices and policies in LBH has been extracted from the following documents and is summarised below:

- London Borough of Haringey Local Plan;
- London Borough of Haringey Sustainable Design and Construction Supplementary Planning Document (adopted May 2013); and
- North London Joint Waste Strategy.

LBH has strategies in place which seek to deliver more sustainable waste management, namely encouraging waste reduction, maximising re-use and recycling and treating remaining waste as a resource in line with the waste hierarchy.

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LBH currently collects mixed recyclables (paper, cardboard, plastic, glass, cans), organics (food and garden waste) and residual waste. Bulky waste collection is also provided. For businesses, commercial collection services of residual waste and dry recycling can be provided. Local planning guidance states that consideration should be given to how the storage and collection of waste and recyclable material can best be incorporated. Commercial waste collection is dependent on waste type and storage capacity. All waste storage areas, internal and external, must be easily accessible to both collectors and occupants. Enough space should be provided on-site to securely and safely store all waste and recycling containers. Space should be provided inside buildings to allow the separation of waste into containers for recyclables, organics and residual waste.

The LBH require all major planning applications within LBH to provide a Site Waste Management Plan (SWMP) with any planning submission. The content of the plan must include full details of the arrangements for the storage and collection of waste for disposal and waste to be recycled. The plan must make reference to the following:

- The number, type and size of receptacles to be dedicated to storage of residual waste and recyclables;
- The positions where receptacles are to be stored between collections;
- The size, design and materials used in construction of any housing built for the storage of receptacles;
- Access arrangements for persons using receptacles showing that consideration has been given to safety, equalities, convenience, user friendliness and maximum walking distances under building regulations; and
- Access arrangements for collection personnel giving consideration to Health and Safety at Work Act, recommended maximum pulling distances for receptacles, vehicle access, height and turning requirements and the construction and width of pathways, doors and access ways.

LBH is working with the North London Boroughs of Hackney, Enfield, Waltham Forest, Barnet, Camden and Islington as part of the North London Waste Plan (NLWP) to achieve 45% recycling and composting standards by 2015 and 50% by 2020 in line with national policy. LBH aim to meet the targets set in the NLWP in a sustainable manner by:

- Promoting the prevention and reduction of waste produced in the borough, increasing the re-use of materials wherever possible, and seeking to increase recycling and composting of waste;
- Ensuring that new development including change of use provides accessible, adequate and well-designed internal and external storage facilities and recycling infrastructure for both residual and recyclable wastes;
- Ensuring that waste is minimised during the design and construction of new developments, encourage the use of sustainably sourced materials and requiring developments to make on-site provision for the recycling and re-use of construction, demolition and operational wastes;
- Ensuring there is sufficient land allocated for waste management purposes and establishing appropriate policies for waste applications to maximise self-sufficiency through the Joint NLWP and applying its policies to waste development. Additionally the council will safeguard existing waste management sites within LBWF; and
- Encouraging waste to be treated as close to the source as possible and encouraging sustainable movement of waste, maximising the potential use of rail and water transport where waste is not treated at its source.

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Tottenham Hotspur Football Club Waste Management Policy

THFC is committed to manage its waste in line with the waste hierarchy, as shown in **Figure 1**, and other relevant national and local legislation and guidance. The client recognises that in order for the buildings to operate in a productive and efficient manner good waste management is required. A meeting with THFC staff and the design team was held on 12th February 2015 to discuss the preliminary waste management aims and aspirations.

THFC have produced a Waste Management Policy to ensure that all waste generated is disposed of safely and efficiently to ensure good waste management. This document is principally focussed on the stadium although some of the key objectives and principles are relevant to the hotel and residential towers. The key principles and aims and aspirations for the residential towers are summarised below:

Residential Towers

- Waste is to be managed in line with the waste hierarchy with zero waste sent to landfill;
- Encourage waste minimisation and promote recycling and re-use with a minimum of 50% recycling aiming to target 60% recycling and composting by 2020 in line with London Major and LBH targets;
- Provide appropriate storage facilities for recyclables, organic (food) and residual wastes; and
- Provision for other wastes including bulky waste.

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Appendix B – Waste generation (per room type)

Land Use	Units	Waste Generation Rate (litres per household)	Weekly Litres
Tower A			
Studio	4	100	400
One bedroom	71	100	7100
Two bedrooms	89	170	15130
Three bedrooms	4	240	960
TOTAL	**168**	-	**23590**

Land Use	Units	Waste Generation Rate (litres per household)	Weekly Litres
Tower B			**-**
Studio	4	100	400
One bedroom	38	100	3800
Two bedrooms	39	170	6630
Three bedrooms	9	240	2160
TOTAL	**90**	-	**12990**

Land Use	Units	Waste Generation Rate (litres per household)	Weekly Litres
Tower C			**-**
Studio	4	100	400
One bedroom	103	100	10300
Two bedrooms	121	170	20570

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Three bedrooms	4	240	960
TOTAL	**232**	-	**32230**

Land Use	Units	Waste Generation Rate (litres per household)	Weekly Litres
Tower D			
Studio	4	100	400
One bedroom	38	100	3800
Two bedrooms	39	170	6630
Three bedrooms	9	240	2160
TOTAL	**90**	-	**12990**

Land Use	Units	Waste Generation Rate (litres per household)	Weekly Litres
Town House			
Two bedrooms			
Three bedrooms	5	240	1200
TOTAL	**5**	-	**1200**

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